

A Land of Flowers on a Latitude of Deserts: Aiding Conservation and Management of Florida's Biodiversity by using Predictions from "Down-Scaled" AOGCM Climate Scenarios in Combination with Ecological Modeling

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Summary: La Florida, the “Land of Flowers”, straddles the latitudes that form the northern hemisphere’s desert belt; Orlando lies only one degree of latitude south of Cairo, Egypt. Florida’s uniqueness lies in the fact it is a long narrow peninsula surrounded on three sides by warm water. In this unique situation, there are many important questions about how Florida’s biodiversity will respond to a changing climate. Which species and habitats will increase and which will decrease? What role does human induced land use – land cover (LULC) change play? Before these questions can be answered, accurate regional climate change scenarios must be developed. This project use down-scale predictions from a suite of coupled Atmospheric-Ocean General Circulation Models (AOGCMs) to make regional scale predictions for the Florida peninsula. Climate outputs will then be used as inputs to a suite of species / habitat / ecosystem models that are currently being used in the Greater Everglades and Suwannee River-Big Bend, as a proof of concept that down-scaled climate results can work in ecological forecast models. Scientists will run three scenarios of LULC: past (circa 1900), present, and future (2021-2050). Additional climate model runs will address the contribution of green house gasses to climate variability and change over the Florida peninsula. Model perturbation experiments will be performed to address sources of variability and their contribution to the output regional climate change scenarios. The project will develop scenarios that specifically address potential changes in temperature (land and near sea surface) and rainfall fields over the peninsula. The scenarios and modeling results will be provided to state, federal, and NGO resource management groups via workshops in which the scenarios will be used to predict responses of additional selected species, habitats and ecosystems.

Partnering with USGS scientists on this project are the Center for Ocean and Atmospheric Prediction Studies in the Department of Meteorology at Florida State University in Tallahassee, and the Department of Fisheries & Aquatic Sciences at the University of Florida, Gainesville. Other beneficiaries are the US Fish and Wildlife Service, Everglades National Park, the US Corps of Engineers and state and local ecological and water management offices.

